CLAIMS

What we claim is:

1. A connector comprising:

a structure defining an interior cavity for receiving a mating component;

a plurality of electrical contact elements provided adjacent to a first interior surface of the structure; and

a coupling structure disposed on at least a second interior surface to at least partially defines a dimension of the cavity, wherein the coupling structure is integrally formed from a combination that includes a plurality of discrete elements, the plurality of discrete elements being aligned to receive an insertion force that is provided to insert the mating component into the interior cavity, wherein the plurality of elements are structured so that in response to the insertion force affecting at least some of the plurality of elements, the affected elements are configured to move from an original state into a biased state and reduce an overall thickness of the coupling structure so as to increase the dimension of the cavity in a direction that is orthogonal to the insertion force;

wherein each of the plurality of elements is structured so that, after being affected by the insertion force, each element is biased to tend towards (i) returning to the original state and (ii) cause an expansion of the coupling structure in a direction that decreases the dimension of the cavity.

2. The connector of claim 1, wherein the couplings structure is structured so that the insertion force is distributed substantially uniformly to each of the affected elements in the plurality of elements.

3. The connector of claim 1, wherein the coupling structure includes a matrix material in which the plurality of elements are disposed in.

4. The connector of claim 1, wherein before the insertion force is applied, the

plurality of elements include a set of elements that have a first skewed orientation with respect to a primary direction in which the insertion force is to be applied, and wherein the set of elements are aligned to increase in skew when affected by the insertion force.

5. The connector of claim 4, wherein after the insertion force is applied, the set of elements are biased to reduce in skew towards the first skewed orientation.

6. The connector of claim 1, wherein the dimension of the cavity is sufficient for electrical contact elements provided on a front surface of the mating component to be received within the cavity in a matable position relative to the plurality of electrical contact elements only after the dimension of the cavity is increased.

7. The connector of claim 6, wherein after the mating component is inserted and the affected elements are in the biased state, the plurality of elements are aligned so that the affected elements press against a back surface of the mating component so that an active force is provided to maintain the electrical contact elements provided on the front side of the mating component in contact with the plurality of electrical contact elements of the connector.

8. The connector of claim 1, wherein the plurality of contact elements of the coupling structure are aligned so that the insertion force corresponds to the mating component contacting the coupling structure.

9. The connector of claim 1, wherein the first interior surface and the second interior surface oppose one another across the cavity.

10. The connector of claim 1, wherein each of the elements includes a member that is transverse and skewed relative to a primary direction of the insertion force.

11. The connector of claim 10, wherein the member of at least some of the elements is aligned to be deflected and become more skewed relative to the primary direction of the insertion force when the insertion force is applied.

12. The connector of claim 1, wherein the member of each element in the plurality of elements is configured to have a bias towards becoming less skewed after the insertion force is applied and the mating component is inserted, and wherein the bias coincides with the coupling structure pressing against the mating component.

13. The connector of claim 1, wherein each of the plurality of elements have a shape selected from a group of shapes consisting of a Z-shape, a rhombus shape, a hourglass shape, a cantilever shape and a leaf spring shape.

14. The connector of claim 1, further comprising:
one or more lever arms pivotally coupled to the structure, wherein the lever arms are pivotally coupled to be directed into the coupling structure in order to provide the insertion force.

15. The connector of claim 14, wherein the insertion force corresponds to the one or more lever arms making contact and being directed into the coupling structure on an edge surface of the coupling structure.

16. The connector of claim 15, wherein all of the plurality of elements are affected substantially uniformly by the insertion force upon the one or more lever arms making contact and being directed into the coupling structure on the edge surface of the coupling structure.

17. A connector comprising:
a structure defining a cavity;

one or more electrical contact elements provided on the structure; and

a coupling structure formed from a matrix material comprising a plurality of elements, the plurality of elements being aligned to receive an insertion force for inserting a mating component into the interior cavity, wherein the plurality of elements are structured so that the insertion force is distributed substantially uniformly amongst multiple elements in the plurality of elements that are part of a portion of the coupling structure that is affected by the insertion force, the elements in the portion being forced from an original state into a biased state, wherein when the elements are in the biased state, a thickness of the coupling structure is reduced; and

wherein a dimension of the cavity is proportional to the thickness of the coupling structure, so that the dimension of the cavity is increased when the thickness of the coupling structure is reduced.

18. The connector of claim 17, wherein before the insertion force is applied, the plurality of elements include a set of elements that have a first skewed orientation with respect to a primary direction in which the insertion force is to be applied, and wherein the set of elements are aligned to increase in skew when affected by the insertion force.

19. The connector of claim 18, wherein after the insertion force is applied, the set of elements are biased to reduce in skew towards the first skewed orientation.

20. The connector of claim 17, wherein each of the elements includes a member that is transverse and skewed relative to a primary direction of the insertion force.

21. The connector of claim 17, wherein the member of at least some of the elements is aligned to be deflected and become more skewed relative to the primary direction of the insertion force when the insertion force is applied.

22. The connector of claim 17, wherein the member of each element in the plurality

of elements is configured to have a bias towards becoming less skewed after the insertion force is applied and the mating component is inserted, and wherein the bias coincides with the coupling structure pressing against the mating component.

23. A connector assembly comprising:

a first connector comprising a first mating section upon which a first plurality of contact elements are distributed;

a component comprising a cavity for receiving the mating section, and the component having a second plurality of contact elements;

a coupling structure disposed on a surface of at least one of the mating section and the cavity, the coupling structure being formed from a matrix material comprising a plurality of elements, the plurality of elements being aligned to be affected by an insertion force for insertion the component into the cavity, wherein the plurality of elements are structured so that the insertion force is distributed substantially uniformly amongst multiple elements in the plurality of elements that are part of a portion of the coupling structure that is affected by the insertion force, the elements in the portion being forced from an original state into a biased state, wherein when the elements are in the biased state, a thickness of the coupling structure is reduced; and

wherein a dimension of the cavity with respect to a size of the mating section is proportional to the thickness of the coupling structure, so that the dimension of the cavity accommodates the mating section only after the thickness of the coupling structure is reduced.

24. The connector apparatus of claim 23, wherein the coupling structure is disposed on the surface of the mating section.

25. The connector apparatus of claim 23, wherein the coupling structure is disposed on the surface of the cavity.

26. The connector apparatus of claim 23, wherein the coupling structure is disposed on both the surface of the mating section and the surface of the cavity.